

**Octopamine neurotransmission in the control of insect reproduction**  
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Octopamine is a biogenic amine structurally similar to the catecholamines dopamine and noradrenaline. In invertebrate species, Octopamine acts as neurotransmitter/ neuromodulator/ neurohormone affecting several aspects of their physiology and behaviour.

We study the molecular genetics of genes involved in Octopamine biosynthesis in order to reveal its role and the molecular mechanisms underlying its action in the model organism *Drosophila*. By analysing octopamine-less flies we have established that Octopamine is absolutely required for female fecundity. Getting released by a specific neuronal population, Octopamine controls ovulation process and its absence leads to a profound female sterility phenotype due to retention of mature eggs within the ovaries.

Reproduction is essential for insect population survival. Our work in *Drosophila* identifies a regulatory mechanism that is based on neuronal function and governs ovulation, thus can potentially constitute a target for insect control. Entertaining this idea, we have recently initiated a study to explore the Octopamine system in *Anopheles gambiae*. The current effort concentrates on cloning and analysis of a gene in the Octopamine biosynthetic pathway, as well as its inactivation in order to induce depletion of Octopamine in this species. Our goal is to analyze mutant phenotypes relevant to the reproductive process or to other functions vital for the mosquito physiology and design experimental strategies that will potentially allow interference with the reproductive competence of the mosquito wild type population.